

Weekly Coal Production

Production for Week Ended:
March 7, 1992



Preface

The *Weekly Coal Production* (WCP) report provides weekly estimates of U.S. coal production by State.

Preliminary coal production data are published quarterly, based on production data collected using Form EIA-6, "Coal Distribution Report." Based on 1988 through 1990 data, the coal production estimation error for a quarter at the national level (i.e., the difference between the sum of the weekly estimates for a quarter and the quarterly EIA-6 preliminary data) ranges from 1 percent to 4 percent for 1988, 1 percent to 2 percent for 1989, and 0.3 percent to 3 percent for 1990.

Final coal production data are published annually, based on the EIA-7A coal production survey. Based on 1988 through 1990 data, the revision error for a quarter at the national level (i.e., the difference between the EIA-6 preliminary data and the EIA-7A final data) ranges from 0.02 percent to 0.08 percent for 1988, 0.09 percent to 0.14 percent for 1989, and 0.01 percent to 0.05 percent for 1990. Usually the EIA-7A coal production data are higher than the

EIA-6 coal production data, due to the differences in the threshold reporting requirements.

This publication is prepared by the Survey Management Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration (EIA) to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (P.L. 93-275) as amended. *Weekly Coal Production* is intended for use by industry, press, State and local governments, and consumers. Other publications that may be of interest are the quarterly *Coal Distribution*, the *Quarterly Coal Report*, *Coal Production 1990*, and *Coal Data: A Reference*.

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U.S. Mine Safety and Health
Administration.

State Coal Profile

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Summary

U.S. coal production in the week ended March 7, 1992, as estimated by the Energy Information Administration, totaled 19 million short tons. This was slightly lower than in the previous week, and 8

percent less than in the comparable week in 1991. Production east of the Mississippi River totaled 11 million short tons, and production west of the Mississippi River totaled 7 million short tons.

Figure 1. Coal Production

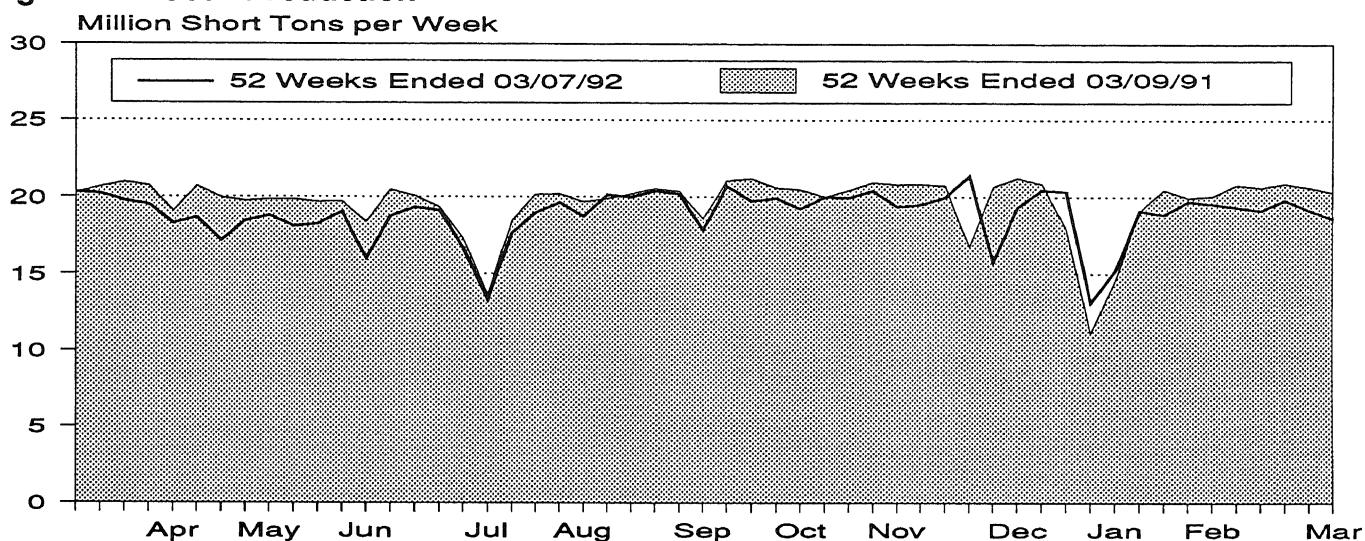


Table 1. Weekly U.S. Coal Production Overview

Production and Carloadings	Week Ended			52 Weeks Ended		
	03/07/92	02/29/92	03/09/91	03/07/92	03/09/91	Percent Change
Production (Thousand Short Tons)						
Bituminous Coal ¹ and Lignite	18,595	19,136	20,259	978,835	1,018,468	-3.9
Pennsylvania Anthracite	49	55	57	2,831	3,427	-17.4
U.S. Total	18,644	19,191	20,316	981,666	1,021,895	-3.9
Railroad Cars Loaded	119,719	123,534	128,386	6,466,063	6,646,266	

¹Includes subbituminous coal.

Notes: All data are preliminary. Totals may not equal sum of components because of independent rounding.

Sources: Association of American Railroads, Transportation Division, Weekly Statement CS-54A; Energy Information Administration, Form EIA-6, "Coal Distribution Report"; Form EIA-7A, "Coal Production Report"; and State mining agency coal production reports.

Table 2. Weekly U.S. Coal Production by Region and State
 (Thousand Short Tons)

Region and State	Week Ended		
	03/07/92	02/29/92	03/09/91
Bituminous Coal¹ and Lignite			
East of the Mississippi	11,181	11,397	11,866
Alabama	578	591	497
Illinois	1,170	1,189	1,298
Indiana	561	515	589
Kentucky	2,911	2,946	3,178
Kentucky, Eastern	2,118	2,110	2,406
Kentucky, Western	792	836	772
Maryland	66	65	78
Ohio	556	607	638
Pennsylvania Bituminous	1,223	1,328	1,144
Tennessee	91	91	100
Virginia	841	845	931
West Virginia	3,184	3,219	3,413
West of the Mississippi	7,414	7,739	8,393
Alaska	34	35	25
Arizona	215	222	277
Arkansas	*	*	*
Colorado	316	374	375
Iowa	7	7	8
Kansas	10	10	10
Louisiana	71	22	59
Missouri	40	41	38
Montana	738	747	765
New Mexico	328	440	407
North Dakota	559	565	655
Oklahoma	50	46	25
Texas	943	973	1,026
Utah	400	445	442
Washington	92	95	103
Wyoming	3,611	3,717	4,178
Bituminous Coal¹ and Lignite Total	18,595	19,136	20,259
Pennsylvania Anthracite	49	55	57
U.S. Total	18,644	19,191	20,316

bituminous coal.

¹ Thousand short tons.

Iminary. Totals may not equal sum of components because of independent rounding.

Source: American Railroads, Transportation Division, Weekly Statement CS-54A; Energy Information Agency, "Coal Distribution Report"; Form EIA-7A, "Coal Production Report"; and State mining agency.

State Coal Profile: West Virginia

Total Area of State:

24,181 square miles

Area Underlain by Coal:

16,800 square miles

Demonstrated Reserve Base of Coal:
(January 1, 1991)

37 billion short tons
(8 percent of U.S. total)

First Year of Documented Coal Production:

1840 (300,000 short tons)

Peak Year of Coal Production:

1947 (176 million short tons)

1990 Coal Production:

169 million short tons
(16 percent of U.S. total)

1990 f.o.b. Mine Price:

\$28.62 per short ton
(U.S. average = \$21.76)

1990 Coal Consumption:

35 million short tons
(4 percent of U.S. total)

1990 Coal Exports:

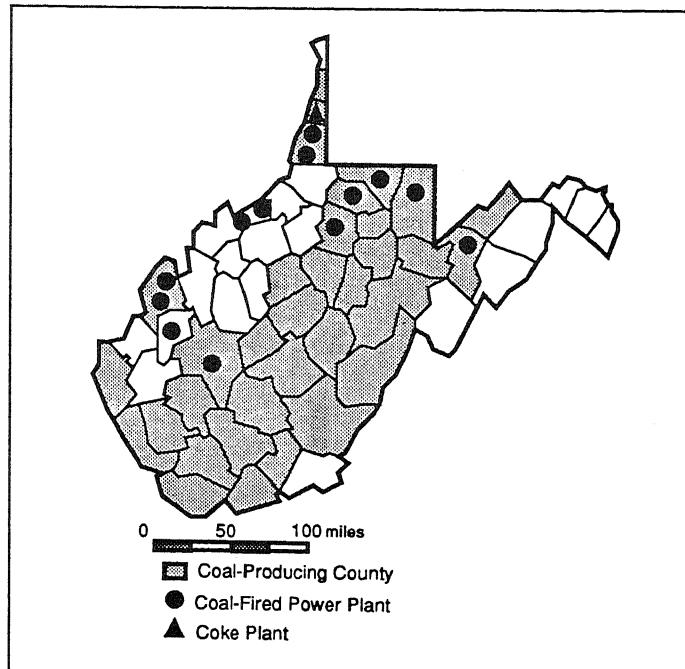
49 million short tons
(47 percent of U.S. total)

Number of Mines (1990)
Underground
Surface

Number of Miners (1990)
(at mines producing more than 10,000 short tons)
Underground
Surface

Average Quality of Utility Coal Receipts (1990)

Heat Content
(million Btu per short ton)
Sulfur Content
(percent by weight)
Ash Content
(percent by weight)



West Virginia's large resources of bituminous coal have long been an important source of energy for the Nation. More than 10 billion short tons have been produced in the State since mining began in the early 1800's. Although West Virginia's coal output of 169 million short tons in 1990 ranked third nationally, the State was the leader in underground coal production, underground miners, longwall mining installations, metallurgical coal production, coal exports, and value of total coal produced. Valued at \$4.8 billion, West Virginia's 1990 coal output dominated the State's mineral economy, accounting for about 86 percent of the total value of all mineral commodities produced in the State.

Bituminous coal underlies more than two-thirds of West Virginia, occurring in all but two of the State's 55 counties. The coal deposits are divided into two large fields, the Northern and the Southern, by a geological "hinge line" that trends from northeast to southwest across the center of the State. The region north of this feature was relatively stable during periods of coal formation, while the region to the south was subsiding. As a result, the coalbeds in the Northern Field generally occur in a regular sequence over a wide area. By contrast, the coalbeds in the Southern Field vary more in thickness, and the beds of commercial interest occur in smaller areas.

Coal from the Southern Field generally is of higher quality than coal from the Northern Field. The average heating value ranges from 24 to 30 million Btu per short ton in the Southern Field, compared with 22 to 27 million Btu per short ton in the Northern Field. Coal with a sulfur content below 1.5 percent (by weight) and an ash content of 6 percent or less is essentially restricted to the Southern Field.

More than 100 coalbeds have been named in West Virginia, but only 62 are of a thickness and quality suitable for mining, and most of these are in the Southern Field. The average thickness of the beds mined ranges from 3 to 7 feet. Nearly half of the State's coal production in 1990 was from four coalbeds: the Pittsburgh and the Lower Kittanning in the Northern Field, and the Stockton-Lewis and the Coalburg in the Southern Field. The Pittsburgh was the principal bed, with 20 percent of total production. Although most of West Virginia's coal can be converted into coke, only coal with a low sulfur and ash content is used to produce coke for metallurgical purposes. The preeminent coking coal in the State is from the Pocahontas No. 3 coalbed in the Southern Field. It is rated as the world standard for low-volatile bituminous metallurgical coal. This is the second most important after the Pittsburgh.

Virginia in the early 1700's and settlers. The first

significant industrial use of coal in the State was in the early 1800's, when it replaced wood as a source of heat for the salt industry in the Kanawha Valley. Other local industries that consumed coal during the same period included ironworks, foundries, paper mills, glass factories, distilleries, and cotton and wool factories. Around the mid 1800's, illuminating oil and lubricants were produced from cannel coal, a variety of bituminous coal, mined in the Kanawha and Elk valleys. Coke production began in the State in the late 1800's.

In 1840, West Virginia's coal production was about 300,000 short tons, with over two-thirds used in manufacturing salt. Production increased slowly until river transportation improved and the railroads expanded into new mining areas in the late 1800's. With coal transportation facilities established, the State's annual coal output rose rapidly from 23 million short tons in 1900 to 146 million short tons in 1927. This was followed by a drop during the Depression and then by a period of recovery. Production exceeded 150 million short tons during World War II and reached an all-time high of 176 million short tons in 1947, when large amounts of coal were shipped to Europe during the postwar recovery period. Production in subsequent years fluctuated, reflecting the impact of the increased use of diesel locomotives and other competition from petroleum, decreased demand for coking coal, changes in foreign demand for West Virginia coal, new requirements in mining and environmental laws, and coal miners' strikes. West Virginia's coal production fell below 100 million short tons in the late 1970's before resuming an upward trend. Production was 169 million short tons in 1990 and is estimated to be about 167 million short tons in 1991.

The relatively easy access to coalbeds on the sides of valleys has encouraged the opening of many small mines in West Virginia. In 1990, about three-fourths of the active mines in the State were relatively small, producing less than 200,000 short tons each and together accounting for less than 20 percent of the State's total coal output.

Underground mining, long the dominant method of producing coal in West Virginia, accounted for nearly three-fourths of the State's coal production in 1990. Although 491 underground mines (64 percent of the total) were in operation in 1990, nearly half of the 123 million short tons produced by this method was from 28 mines (6 percent) producing more than 1 million short tons each. Five of these mines were among the top 10 producers in the East in 1990. The largest, producing more than 4 million short tons, was the Federal No. 2 mine of the Eastern Associated Coal Corporation, in Monongalia County. Of the coal produced underground in West Virginia, over 60 percent was by continuous mining machines.

Twenty-six longwall installations accounted for most of the balance.

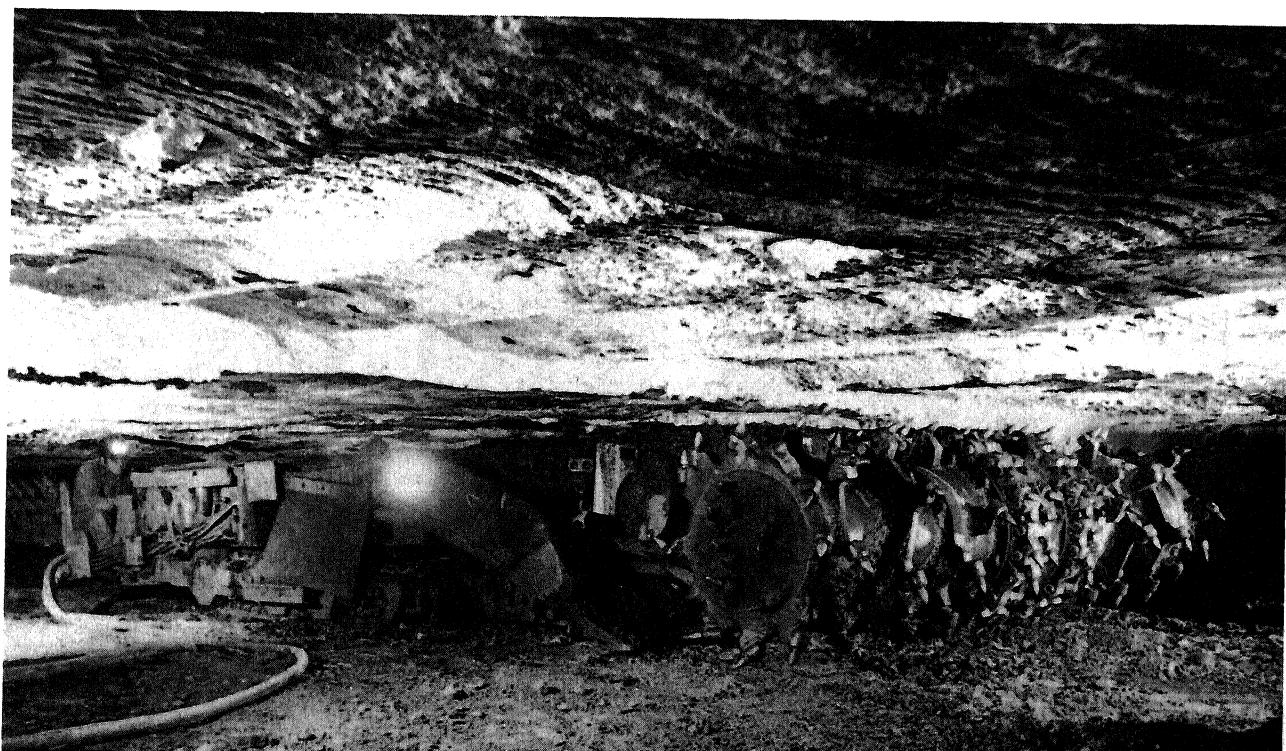
Surface mining of coal in West Virginia dates back to about 1916, but this method of production did not become important until the 1940's. In 1990, a total of 46 million short tons was produced at 280 surface mines. Eleven of these mines produced over 1 million short tons each to account for about 40 percent of the surface-mined tonnage.

Miner productivity in West Virginia in 1990 averaged 2.7 short tons per hour at underground mines and 4.0 short tons at surface mines. Both were above the average for the Appalachian Region. About 170 coal preparation plants were operating in the State.

Most of the coal produced in West Virginia is shipped out of the State. Of the 167 million short tons of West Virginia coal distributed in 1990, about 20 percent (33 million short tons) remained in the State, 51 percent was shipped to 35 other States, and 29 percent was exported. Nearly two-thirds of the coal shipments to other States was for electric power plants, chiefly in Ohio and Pennsylvania. About 16 percent was metallurgical coal, delivered principally

to Pennsylvania, Ohio, and Indiana. The balance was mostly for other industrial uses. More than three-fourths of the 49 million short tons of coal exported from West Virginia in 1990 was estimated to be metallurgical coal.

Coal consumption in West Virginia in 1990 was 35 million short tons, which ranked the State fifth nationally. The electric utility industry has been West Virginia's principal coal consumer since the late 1960's, with the increased use of utility coal more than offsetting the loss in other sectors. In 1970, West Virginia's power plants consumed 15 million short tons of coal, accounting for about 60 percent of the State's total coal consumption. The 30 million short tons used to generate electricity in 1990 represented 86 percent of the total. Most of the utility coal was produced in West Virginia. Deliveries of metallurgical coal to the State's only coke plant, operated by the Wheeling-Pittsburgh Steel Corporation at East Steubenville, amounted to about 3 million short tons in 1990, with slightly more than half of the tonnage from West Virginia and the rest mostly from Virginia. Other industrial consumers, chiefly chemical and metal manufacturers, used about 2 million short tons of coal, almost all from West Virginia.



Continuous mining machines like this account for about 60 percent of West Virginia's underground coal production.

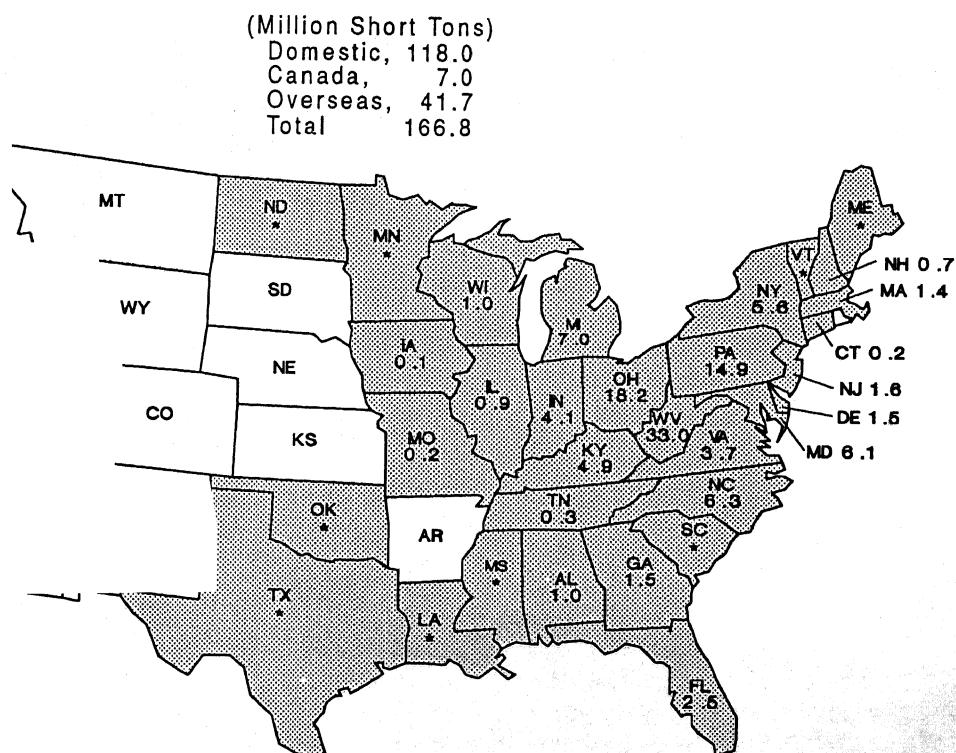
West Virginia depends on 13 coal-fired power plants for virtually all of its electricity generation. These plants accounted for nearly all of the 77 billion kilowatthours generated in the State in 1990; less than 1 percent was from eight hydropower plants and one gas turbine generator. At the beginning of 1991, the net summer generating capability of the State's coal-fired power plants was 14,315 megawatts (MW), which ranked sixth among the States with coal-fired power plants. The 2,900 MW John E. Amos plant of the Appalachian Power Company, in Putman County, is the largest power plant in West Virginia and the fifth largest coal-fired power plant in the United States. The second largest power plant in West Virginia is the 1,920 MW Harrison plant of the Monongahela Power Company, in Harrison County.

Annual coal production in West Virginia in 1992 is projected to rise slightly over the estimated 167 million short tons produced in 1991. The impact of the 1990 Clean Air Act Amendments on the State's future coal output is uncertain. Although the State

contains reserves of high-Btu, low-sulfur coal, many of the highest-quality and most accessible coal deposits have already been mined. The outlook for West Virginia's coal exports is expected to improve with the decline in government coal subsidies in Europe.

West Virginia's coalbeds are a potential source of methane that could supplement the supply of natural gas, which is composed chiefly of methane. Coalbed methane has been produced on a small scale since the 1930's from wells in Wetzel County that intersected coalbeds while drilling for deeper natural gas reservoirs. In recent years, small amounts of methane have also been produced from coal mines in the northern part of the State. In 1991, production from one of these wells averaged 100,000 cubic feet per day, which was sold to a commercial gas company. Despite tax credits available for coalbed methane production, development of this resource in West Virginia has been discouraged by low prices and market conditions for natural gas, as well as by legal issues concerning ownership of the gas and water disposal.

Distribution of West Virginia Coal, 1990



* Less than 0.1 million short tons

Note: Total does not equal sum of components because of independent rounding.

Source: Energy Information Administration, *Coal Distribution January-December 1990*, DOE/EIA-0125(90/4Q).

References:

Energy Information Administration: *Coal Production* (various issues); *Quarterly Coal Report* (various issues); *Coal Distribution January-December 1990* (April 1991); *Cost and Quality of Fuels for Electric Utility Plants in 1990* (August 1991); *Inventory of Power Plants 1990* (October 1991); *Electric Power Annual* (various issues); *State Energy Data Report: Consumption Estimates 1960-1989* (May 1991). U.S. Department of the Interior, Bureau of Mines, *State Mineral Summaries 1991*. West Virginia Geological and Economic Survey: Tom Repine and Steve McClelland, personal communications (1992); Coal-Geology Bulletin No. 2, *Coal and Coal Mining in West Virginia* (1974); Educational Series, *Coal and Coal Mining in West Virginia* (1964); *Spectrum of West*

Virginia Coal; "West Virginia's No. 3 Pocahontas Coal-One of the World's Finest," *Mountain State Geology* (1984). West Virginia Coal Association, *Coal Facts '91*. West Virginia Department of Energy, *Annual Report and Directory of Mines*, 1990. West Virginia: *A History* (Lexington, KY: The University Press of Kentucky, 1985). 1989 *Keystone Coal Industry Manual* (Chicago, IL: Maclean Hunter Publishing Co.). "As Time Changes, So Do Longwalls," *Coal*, Vol. 96, No. 2 (February 1991), pp. 40-49. "Black Thunder Mine Again Leads in U.S. Coal Production, *Coal*, Vol. 97, No. 1 (January 1992), p 9. "The United States Coalbed Methane Resource," *Quarterly Review of Methane from Coal Seams Technology*, Vol. 7, No. 3 (March 1990), pp. 10-28. "Methane from Coal Seams Research: Northern Appalachian Basin," *Quarterly Review of Methane from Coal Seams Technology*, Vol. 8, No. 4 (July 1991), pp. 27-32.

Methodology

Weekly Data

Estimates of national weekly coal production are based on weekly carload data collected by the Association of American Railroads (AAR) from its members (Class I Railroads) and certain other railroads. EIA calculates the average number of tons per carload for each railroad's coal car fleet from information obtained from the most recent Quarterly Freight Commodity Statistics filed by Class I Railroads with the Interstate Commerce Commission (ICC) and from data made available by individual railroads. The average number of tons per carload is then multiplied by the number of cars loaded to obtain an estimate of weekly production shipped by AAR railroads.

Next, the weekly coal production estimate for a specific week is obtained by dividing the AAR rail tonnage for the week by a factor representing the proportion of quarterly AAR rail shipments to total quarterly coal production. Because this is done on a weekly basis, and prior to completion of current quarterly statistics, the factor is derived using ICC data on tons per carload and total carloadings and from EIA data on total production for the same quarter of the previous year. Figures for the same quarter of the year are used in order to reflect seasonal variation. In some cases, the ratio of rail tonnage to total production is adjusted to take additional, more current information into consideration, such as rail or coal strikes.

Once the U.S. weekly coal production estimate is determined, this total is split into two subtotals - the portion representing States, with little or no rail coal shipments, and the portion representing the remaining States, where a significant percentage of production is shipped by rail. The States with little or no railroad coal shipments are Alaska, Arizona, California, Georgia, Iowa, Kansas, Louisiana, Missouri, Texas, and Washington. With the exception of California and Louisiana, the weekly production data for each "nonrail" State are developed by multiplying the estimate of U.S. weekly coal production by the ratio of projected production, for each State to U.S. total projected production, for the current quarter. The methodology used to project State coal production is given in the EIA publication *Model Documentation of the Short-Term Coal Analysis System* (DOE/EIA-0394). The EIA contacts the sole producer in Louisiana and California to obtain weekly production data.

Estimates for the remaining States are in aggregate equal to the U.S. weekly coal production minus the estimated production from the nonrail States.

Estimates for "rail States" are based on the AAR carload data compiled by State of origin, including separate estimates for the anthracite and bituminous coal regions in Pennsylvania, eastern and western Kentucky and northern and southern West Virginia.

Each railroad is contacted at least annually for information concerning the distribution (by state of origin) of its railroad carloadings of coal. These distribution percentages are multiplied by the railroad's weekly loadings and ICC derived tonnage per carload figures, to derive the weekly tonnages loaded by State and by railroad. The tonnages loaded by the various railroads are then summed by each State to estimate total production shipped by AAR rail for that State. These tonnages are divided by the most recent ratio of annual AAR rail tonnage to total annual production for each State. The resulting weekly coal production estimates for the rail States are then adjusted to ensure that each State's production figure contributes proportionately to the weekly coal production estimate previously derived in aggregate for the rail States.

Monthly Data

Preliminary estimates of monthly coal production by State are obtained by summing weekly coal production estimates published in the *Weekly Coal Production* report. If a week extends into a new month, the production is allocated by day, and the days are added to the month in which they occur. For weeks without holidays, the allocation is Monday through Friday, 18.4 percent each day; Saturday, 8 percent; and Sunday, 0 percent. For weeks with a holiday occurring on a day other than Sunday, the allocation is Sunday and the holiday, 0 percent; and any other day, 20 percent.

Preliminary weekly and monthly production estimates are revised quarterly when quarterly production data become available. Preliminary weekly and monthly estimates are proportionately adjusted to conform to the quarterly production figure.

Quarterly Data

Estimates of quarterly coal production are based on data collected quarterly on Form EIA-6, with certain adjustments. The national estimate of quarterly coal production is set equal to the quarterly U.S. coal production total as reported on the Form EIA-6. Based on 1988 through 1990 data, the coal production estimation error for a quarter at the national level (i.e., the difference between the sum of

the weekly estimates for a quarter and the quarterly EIA-6 preliminary data) ranges from 1 percent to 4 percent for 1988, 1 percent to 2 percent for 1989, and 0.3 percent to 3 percent for 1990.

The quarterly production data, although published throughout the year, are considered preliminary until EIA annual production data are finalized in September of the following year. At that time quarterly production data are revised (proportionately adjusted) to conform to the final annual production figures.

Finalizing Annual Production

Preliminary total annual U.S. coal production, as reported in the *Weekly Coal Production* report in the first week in January of the following year, is the sum of revised monthly/quarterly estimates of production for the first 9 months (first three quarters) and a preliminary estimate of fourth quarter production derived from weekly estimates.

When production data for the fourth quarter of the year become available from Form EIA-6 in March of the following year, the preliminary fourth-quarter U.S. total production figure and corresponding State-level figures may or may not be revised, depending on the size of the difference between the estimates and fourth-quarter data. As a general practice, EIA does not revise the initial annual production estimates (determined initially in January of the following year). Weekly, monthly, and quarterly State and national production data are adjusted to conform to finalized annual production figures derived from Form EIA-7A, in September of the following year.

Based on 1988 through 1990 data, the revision error for a quarter at the national level (i.e., the difference between the EIA-6 preliminary data and the EIA-7A final data) ranges from 0.02 percent to 0.08 percent for 1988, 0.09 percent to 0.14 percent for 1989, and 0.01 percent to 0.05 percent for 1990. Usually the EIA-7A coal production data are higher than the EIA-6 coal production data, due to differences in the threshold reporting requirements.